

July 30, 2018

Rev 0



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July 30, 2018

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHCPRC SAF S18-006
Work Order: 453849
SDG: GEL453849

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 03, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

Anna Dupree for
Heather Shaffer
Project Manager

Purchase Order: 300071-7H
Chain of Custody: S18-006-133
Enclosures



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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION (SIR) REPORT		SIR Number: SIR18-0808 Rev. Number: 0 Date Initiated: 07/05/2018
<u>SAMPLE EVENT INFORMATION</u>		
SAF NUM(S):	S18-006	
LABORATORY:	GEL	
<u>SAMPLING INFORMATION</u>		
NUMBER OF SAMPLES:	1	
SAMPLE NUMBERS:	B3JBY9	
SAMPLE MATRIX:	WATER	
SDG NUM(S):		
<u>ISSUE BACKGROUND</u>		
CLASS:	Field Sampling Issue	
TYPE:	Sample Collection Issue	
DESCRIPTION:	For sample B3JBY9, 2 of the 5 vials were received with headspace.	
<u>RESOLUTION</u>		
PROPOSED RESOLUTION:	The lab will avoid using the vials with headspace and proceed with analysis.	
FINAL RESOLUTION:	Proposed Resolution accepted.	
SUBMITTED BY:		
DUPREE, ANNA		07/05/2018
ACCEPTED BY:		
HEY, BE		07/05/2018

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHCPRC SAF S18-006
SDG: GEL453849**

July 30, 2018

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on July 03, 2018, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Please see the enclosed SIR for further details.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative.

Sample Identification

The laboratory received the following sample:

<u>Laboratory Identification</u>	<u>Sample Description</u>
453849001	B3JBY9

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Semivolatile, GC/MS Volatile and General Chemistry.

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

July 30, 2018

Rev 0



Anna Dupree for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL453849
Work Order #: 453849

GC/MS Volatile

Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits.

Sample	Analyte	Value
1204063579 (Non SDG 453859001PS)	2-Butanone	62* (70%-130%)
	Acetone	52* (70%-130%)
1204063580 (Non SDG 453859001PSD)	2-Butanone	62* (70%-130%)
	Acetone	46* (70%-130%)

GC/MS Semivolatile

Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Surrogate Recoveries

Samples (See Below) did not meet surrogate recovery acceptance criteria. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1204063167 (MB)	5-alpha-Androstane	57* (70%-130%)
1204063168 (LCS)	5-alpha-Androstane	66* (70%-130%)
1204063169 (B3JBY9MS)	5-alpha-Androstane	55* (70%-130%)

1204063170 (B3JBY9MSD)	5-alpha-Androstane	58* (70%-130%)
453849001 (B3JBY9)	5-alpha-Androstane	48* (70%-130%)

Laboratory Control Sample (LCS) Recovery

The LCS (See Below) spike recoveries were not within acceptance limits. One or more spike recoveries in the MS and MSD were also not within the acceptance limits. All samples in the batch were re-extracted out of holding. The LCS, MS, and MSD spike recoveries were within acceptance criteria for the re-extraction batch. Data for these samples were reported from both sets of extractions.

Sample	Analyte	Value
1204063168 (LCS)	Several	See applicable report

Spike Recovery Statement

The MS and MSD (See Below) spike recoveries were not within acceptance limits. Spike recoveries in the LCS were also not within the acceptance limits. All samples in the batch were re-extracted out of holding. The LCS, MS, and MSD spike recoveries were within acceptance criteria for the re-extraction batch. Data for these samples were reported from both sets of extractions.

Sample	Analyte	Value
1204063169 (B3JBY9MS)	Acenaphthylene	48* (53%-99%)
	Fluorene	46* (50%-116%)
1204063170 (B3JBY9MSD)	Acenaphthylene	52* (53%-99%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD, (See Below), were not within the acceptance limits due to the large difference between the individual recoveries in each MS and MSD analyte pair. The failures may be attributed to an error in the extraction process.

Sample	Analyte	Value
1204063169MS and 1204063170MSD (B3JBY9)	Naphthalene	23* (0%-20%)

Technical Information**Sample Re-extraction/Re-analysis**

Sample 453849001 (B3JBY9) was scheduled for re-extraction due to surrogate failure and/or batch QC failure.

Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Surrogate Recoveries

Samples (See Below) did not meet surrogate recovery acceptance criteria. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1204064611 (MB)	5-alpha-Androstane	59* (70%-130%)
1204064612 (LCS)	5-alpha-Androstane	58* (70%-130%)
1204064613 (B3JBY9MS)	5-alpha-Androstane	56* (70%-130%)
1204064614 (B3JBY9MSD)	5-alpha-Androstane	63* (70%-130%)
453849001 (B3JBY9)	5-alpha-Androstane	53* (70%-130%)

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1204064612 (LCS)	Acenaphthene	67* (70%-130%)
	Benzo(ghi)perylene	63* (70%-130%)
	Naphthalene	65* (70%-130%)

Technical Information**Holding Time Specifications**

Samples (See Below) were re-extracted out of holding due to QC failures. The failures did not confirm, so both sets of results are reported and have been qualified accordingly.

Sample	Value
1204064613 (B3JBY9MS)	Received 03-JUL-18, within holding, prepped 09-JUL-18, out of holding 06-JUL-18
1204064614 (B3JBY9MSD)	Received 03-JUL-18, within holding, prepped 09-JUL-18, out of holding 06-JUL-18
453849001 (B3JBY9)	Received 03-JUL-18, within holding, prepped 09-JUL-18, out of holding 06-JUL-18

General Chemistry**n-Hexane Extractable Material**

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Alkalinity

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

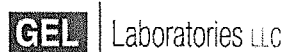
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 453849		C.O.C. # S18-006-133 Page 1 of 1
CH2MHill Plateau Remediation Company <small>Station: CH2M Hill</small>		Telephone No.: 509-376-4650
Collector: <small>CH2M Hill</small>	Contact/Requester: Karen Waters-Husted	Purchase Order/Charge Code: 300071
SAF No.: S18-006	Sampling Origin: Hanford Site	Ice Chest No.: 605-385
Project Title: Surv, June 2018	Logbook No.: HNF-N-506-89-66	Bill of Lading/Air Bill No.: 77261374782
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Offsite Property No.: 9645
Protocol: SURV	Priority: 30 Days	

POSSIBLE SAMPLE HAZARDS/REMARK				SPECIAL INSTRUCTIONS				
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				N/A				
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3JBY9	N	W	6-24-18	1135	4x1-L G	1664A_OILGREASE: COMMON	28 Days	HCl to pH <2 / Cool <=6C
B3JBY9	N	W	6-24-18	1135	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B3JBY9	N	W	6-24-18	1135	5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2 / Cool <=6C
B3JBY9	N	W	6-29-18	1135	4x1-L aG	8270_SVOA_GCMS_SIM: COMMON	7/40 Days	Cool <=6C

Relinquished By: MRCL		Received By: SSU-1		JUN 29 2018 1335	
Print First and Last Name	Signature	Print First and Last Name	Signature	Date/Time	Date/Time
Relinquished By: SSU-1		Received By: SSU-1		JUL 02 2018 0730	
Print First and Last Name	Signature	Print First and Last Name	Signature	Date/Time	Date/Time
Relinquished By: SSU-1		Received By: SSU-1		JUL 02 2018 0730	
Print First and Last Name	Signature	Print First and Last Name	Signature	Date/Time	Date/Time
Relinquished By: Fed Ex		Received By: FEDEX		7/3/18 850	
Print First and Last Name	Signature	Print First and Last Name	Signature	Date/Time	Date/Time
Relinquished By: Fed Ex		Received By: Chakeris Tarplin/ GEL Laboratories		7/3/18 850	
Print First and Last Name	Signature	Print First and Last Name	Signature	Date/Time	Date/Time
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	
Printed On 4/11/2018		FSR ID = FSR60520		A-6004-842 (REV 3)	

Matrix *

S = Soil	DS = Drum Solids
SE = Sediment	DL = Drum Liquid
SO = Solid	T = Tissue
SL = Sludge	WI = Wipe
W = Water	L = Liquid
O = Oil	V = Vegetation
A = Air	X = Other



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>453849</u>		
Received By: <u>C. TARPLIN</u>		Date Received: <u>07-03-2018</u> <u>HS</u>		
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>7726 1374 7182-1c</u> <u>7726 1640 7812(3)-2c</u>		
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.		
Shipped as a DOT Hazardous?	<input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____		
COC/Samples marked or classified as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM/mR/Hr Classified as: <u>Rad 1</u> Rad 2 Rad 3		
Is package, COC, and/or Samples marked HAZ?	<input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other: _____		
Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: _____
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR4-17</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A (If unknown, select No) VOA vials free of headspace? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Sample ID's and containers affected: <u>B3K392 1084</u> <u>B3K387 1084</u> <u>N/A</u> <u>B3JBY9 205</u> <u>B3K380 204</u> <u>05/7/18</u>
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Comments (Use Continuation Form if needed):				

 PM (or PMA) review: Initials AST Date 7/5/18 Page 1 of 1

GL-CHL-SR-001 Rev 5

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The analyte was detected in the associated method blank \geq MDC or $>5\%$ sample activity.	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	
o	Analyte failed to recover within LCS limits	Radiological	Rad

Laboratory Certifications

List of current GEL Certifications as of 30 July 2018

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122018-26
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL453849
Work Order #: 453849**

Product: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 26

Analytical Batch: 1779566

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
453849001	B3JBY9
1204063579	453859001(NonSDG) Post Spike (PS)
1204063580	453859001(NonSDG) Post Spike Duplicate (PSD)
1204063756	Method Blank (MB)
1204063758	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits.

Sample	Analyte	Value
1204063579 (Non SDG 453859001PS)	2-Butanone	62* (70%-130%)
	Acetone	52* (70%-130%)
1204063580 (Non SDG 453859001PSD)	2-Butanone	62* (70%-130%)
	Acetone	46* (70%-130%)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL453849 GEL Work Order: 453849

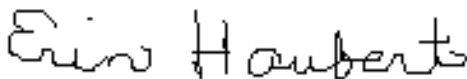
The Qualifiers in this report are defined as follows:

- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:**Name:** Erin Haubert**Date:** 30 JUL 2018**Title:** Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL453849
Lab Sample ID: 453849001

Client ID: B3JBY9
Batch ID: 1779566
Run Date: 07/06/2018 16:31
Prep Date: 07/06/2018 16:31
Data File: 070618V3\3O512.D

Date Collected: 06/29/2018 11:35
Date Received: 07/03/2018 08:50
Client: CPRC001
Method: SW846 8260C
Inst: VOA3.I
Analyst: JP1

Column: DB-624

Matrix: WATER

Project: CPRC0S18006
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	2.12	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary**Report Date: July 10, 2018****Page 1 of 7****CH2MHill Plateau Remediation Company****MSIN R3-50 CHPRC****PO Box 1600****Richland, Washington****Contact: Mr. Scot Fitzgerald****Workorder: 453849**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1779566										
QC1204063758	LCS										
1,1,1-Trichloroethane	50.0			52.8	ug/L		106	(70%-130%)	JP1	07/06/18	11:51
1,1,2-Trichloroethane	50.0			46.6	ug/L		93	(70%-130%)			
1,1-Dichloroethane	50.0			50.8	ug/L		102	(70%-130%)			
1,1-Dichloroethylene	50.0			54.7	ug/L		109	(70%-130%)			
1,2-Dichloroethane	50.0			53.1	ug/L		106	(70%-130%)			
2-Butanone	250			231	ug/L		92	(70%-130%)			
4-Methyl-2-pentanone	250			220	ug/L		88	(70%-130%)			
Acetone	250			241	ug/L		96	(70%-130%)			
Benzene	50.0			48.5	ug/L		97	(70%-130%)			
Carbon disulfide	250			276	ug/L		110	(70%-130%)			
Carbon tetrachloride	50.0			53.9	ug/L		108	(70%-130%)			
Chlorobenzene	50.0			46.3	ug/L		93	(70%-130%)			
Chloroform	50.0			52.7	ug/L		105	(70%-130%)			

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QC Summary**Workorder: 453849****Page 2 of 7**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1779566										
Ethylbenzene	50.0			46.6	ug/L		93	(70%-130%)	JP1	07/06/18	11:51
Methylene chloride	50.0			53.9	ug/L		108	(70%-130%)			
Tetrachloroethylene	50.0			43.4	ug/L		87	(70%-130%)			
Toluene	50.0			46.8	ug/L		94	(70%-130%)			
Trichloroethylene	50.0			51.3	ug/L		103	(70%-130%)			
Vinyl chloride	50.0			45.5	ug/L		91	(70%-130%)			
Xylenes (total)	150			140	ug/L		93	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			53.2	ug/L		106	(70%-130%)			
**Bromofluorobenzene	50.0			51.0	ug/L		102	(70%-130%)			
**Toluene-d8	50.0			49.0	ug/L		98	(70%-130%)			
QC1204063756 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					07/06/18	13:24
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						

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QC Summary**Workorder: 453849****Page 3 of 7**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1779566										
2-Butanone			U	3.00	ug/L				JP1	07/06/18	13:24
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						

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QC Summary

Workorder: 453849

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1779566										
**1,2-Dichloroethane-d4	50.0			53.6	ug/L		107	(70%-130%)	JP1	07/06/18	13:24
**Bromofluorobenzene	50.0			48.9	ug/L		98	(70%-130%)			
**Toluene-d8	50.0			48.1	ug/L		96	(70%-130%)			
QC1204063579 453859001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	58.5	ug/L		117	(70%-130%)		07/06/18	21:12
1,1,2-Trichloroethane	50.0	U	0.00	46.2	ug/L		92	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	53.0	ug/L		106	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	57.2	ug/L		114	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	61.8	ug/L		124	(70%-130%)			
2-Butanone	250	T	18.1 T	172	ug/L		62 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	212	ug/L		85	(70%-130%)			
Acetone	250	T	49.7 T	180	ug/L		52 *	(70%-130%)			
Benzene	50.0	U	0.00	50.0	ug/L		100	(70%-130%)			
Carbon disulfide	250	U	0.00	272	ug/L		109	(70%-130%)			
Carbon tetrachloride	50.0	J	0.390	60.9	ug/L		121	(70%-130%)			
Chlorobenzene	50.0	U	0.00	45.3	ug/L		91	(70%-130%)			

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QC Summary

Workorder: 453849

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch	1779566											
Chloroform	50.0		95.6	E	155	ug/L		118	(70%-130%)	JP1	07/06/18	21:12
Ethylbenzene	50.0	U	0.00		49.2	ug/L		98	(70%-130%)			
Methylene chloride	50.0	U	0.00		52.6	ug/L		105	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00		42.0	ug/L		84	(70%-130%)			
Toluene	50.0	U	0.00		44.5	ug/L		89	(70%-130%)			
Trichloroethylene	50.0	U	0.00		53.0	ug/L		106	(70%-130%)			
Vinyl chloride	50.0	U	0.00		43.6	ug/L		87	(70%-130%)			
Xylenes (total)	150	U	0.00		143	ug/L		95	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		59.1		57.4	ug/L		115	(70%-130%)			
**Bromofluorobenzene	50.0		53.1		48.9	ug/L		98	(70%-130%)			
**Toluene-d8	50.0		48.0		46.0	ug/L		92	(70%-130%)			
QC1204063580 453859001 PSD												
1,1,1-Trichloroethane	50.0	U	0.00		52.5	ug/L	11	105	(0%-20%)		07/06/18	21:43
1,1,2-Trichloroethane	50.0	U	0.00		48.1	ug/L	4	96	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00		49.3	ug/L	7	99	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00		51.9	ug/L	10	104	(0%-20%)			

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QC Summary**Workorder: 453849****Page 6 of 7**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch	1779566											
1,2-Dichloroethane	50.0	U	0.00		55.5	ug/L	11	111	(0%-20%)	JP1	07/06/18	21:43
2-Butanone	250	T	18.1	T	174	ug/L	1	62 *	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00		225	ug/L	6	90	(0%-20%)			
Acetone	250	T	49.7	T	164	ug/L	9	46 *	(0%-20%)			
Benzene	50.0	U	0.00		47.1	ug/L	6	94	(0%-20%)			
Carbon disulfide	250	U	0.00		257	ug/L	6	103	(0%-20%)			
Carbon tetrachloride	50.0	J	0.390		53.8	ug/L	12	107	(0%-20%)			
Chlorobenzene	50.0	U	0.00		48.5	ug/L	7	97	(0%-20%)			
Chloroform	50.0		95.6	E	142	ug/L	8	93	(0%-20%)			
Ethylbenzene	50.0	U	0.00		50.1	ug/L	2	100	(0%-20%)			
Methylene chloride	50.0	U	0.00		51.2	ug/L	3	102	(0%-20%)			
Tetrachloroethylene	50.0	U	0.00		45.1	ug/L	7	90	(0%-20%)			
Toluene	50.0	U	0.00		46.2	ug/L	4	92	(0%-20%)			
Trichloroethylene	50.0	U	0.00		47.6	ug/L	11	95	(0%-20%)			
Vinyl chloride	50.0	U	0.00		43.7	ug/L	0	87	(0%-20%)			

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QC Summary**Workorder: 453849****Page 7 of 7**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1779566										
Xylenes (total)	150	U	0.00	146	ug/L	2	97	(0%-20%)	JP1	07/06/18	21:43
**1,2-Dichloroethane-d4	50.0		59.1	54.1	ug/L		108	(70%-130%)			
**Bromofluorobenzene	50.0		53.1	49.9	ug/L		100	(70%-130%)			
**Toluene-d8	50.0		48.0	49.3	ug/L		99	(70%-130%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Volatile

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of 1

Surrogate Recovery Report

SDG Number: GEL453849

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1204063758	LCS for batch 1779566	106	98	102
1204063756	MB for batch 1779566	107	96	98
453849001	B3JBY9	113	96	102
1204063579	B3K387PS	115	92	98
1204063580	B3K387PSD	108	99	100

Surrogate

Acceptance Limits

DCED4	= 1,2-Dichloroethane-d4	(70%-130%)
TOL	= Toluene-d8	(70%-130%)
BFB	= Bromofluorobenzene	(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL453849
Work Order #: 453849**

Product: Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method: SW846 3510C/8270D SIM
Analytical Procedure: GL-OA-E-009 REV# 40
Analytical Batch: 1779394

Preparation Method: SW846 3510C
Preparation Procedure: GL-OA-E-013 REV# 32
Preparation Batch: 1779393

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
453849001	B3JBY9
1204063167	Method Blank (MB)
1204063168	Laboratory Control Sample (LCS)
1204063169	453849001(B3JBY9) Matrix Spike (MS)
1204063170	453849001(B3JBY9) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Surrogate Recoveries

Samples (See Below) did not meet surrogate recovery acceptance criteria. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1204063167 (MB)	5-alpha-Androstane	57* (70%-130%)
1204063168 (LCS)	5-alpha-Androstane	66* (70%-130%)
1204063169 (B3JBY9MS)	5-alpha-Androstane	55* (70%-130%)
1204063170 (B3JBY9MSD)	5-alpha-Androstane	58* (70%-130%)
453849001 (B3JBY9)	5-alpha-Androstane	48* (70%-130%)

Laboratory Control Sample (LCS) Recovery

The LCS (See Below) spike recoveries were not within acceptance limits. One or more spike recoveries in the MS and MSD were also not within the acceptance limits. All samples in the batch were re-extracted out of holding. The LCS, MS, and MSD spike recoveries were within acceptance criteria for the re-extraction batch.

Data for these samples were reported from both sets of extractions.

Sample	Analyte	Value
1204063168 (LCS)	Several	See applicable report

Spike Recovery Statement

The MS and MSD (See Below) spike recoveries were not within acceptance limits. Spike recoveries in the LCS were also not within the acceptance limits. All samples in the batch were re-extracted out of holding. The LCS, MS, and MSD spike recoveries were within acceptance criteria for the re-extraction batch. Data for these samples were reported from both sets of extractions.

Sample	Analyte	Value
1204063169 (B3JBY9MS)	Acenaphthylene	48* (53%-99%)
	Fluorene	46* (50%-116%)
1204063170 (B3JBY9MSD)	Acenaphthylene	52* (53%-99%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD, (See Below), were not within the acceptance limits due to the large difference between the individual recoveries in each MS and MSD analyte pair. The failures may be attributed to an error in the extraction process.

Sample	Analyte	Value
1204063169MS and 1204063170MSD (B3JBY9)	Naphthalene	23* (0%-20%)

Technical Information

Sample Re-extraction/Re-analysis

Sample 453849001 (B3JBY9) was scheduled for re-extraction due to surrogate failure and/or batch QC failure.

Product: Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

Analytical Method: SW846 3510C/8270D SIM

Analytical Procedure: GL-OA-E-009 REV# 40

Analytical Batch: 1780068

Preparation Method: SW846 3510C

Preparation Procedure: GL-OA-E-013 REV# 32

Preparation Batch: 1780067

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
453849001	B3JBY9
1204064611	Method Blank (MB)
1204064612	Laboratory Control Sample (LCS)
1204064613	453849001(B3JBY9) Matrix Spike (MS)
1204064614	453849001(B3JBY9) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Surrogate Recoveries

Samples (See Below) did not meet surrogate recovery acceptance criteria. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1204064611 (MB)	5-alpha-Androstane	59* (70%-130%)
1204064612 (LCS)	5-alpha-Androstane	58* (70%-130%)
1204064613 (B3JBY9MS)	5-alpha-Androstane	56* (70%-130%)
1204064614 (B3JBY9MSD)	5-alpha-Androstane	63* (70%-130%)
453849001 (B3JBY9)	5-alpha-Androstane	53* (70%-130%)

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1204064612 (LCS)	Acenaphthene	67* (70%-130%)
	Benzo(ghi)perylene	63* (70%-130%)
	Naphthalene	65* (70%-130%)

Technical Information

Holding Time Specifications

Samples (See Below) were re-extracted out of holding due to QC failures. The failures did not confirm, so both sets of results are reported and have been qualified accordingly.

Sample	Value
1204064613 (B3JBY9MS)	Received 03-JUL-18, within holding, prepped 09-JUL-18, out of holding 06-JUL-18
1204064614 (B3JBY9MSD)	Received 03-JUL-18, within holding, prepped 09-JUL-18, out of holding 06-JUL-18
453849001 (B3JBY9)	Received 03-JUL-18, within holding, prepped 09-JUL-18, out of holding 06-JUL-18

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL453849 GEL Work Order: 453849

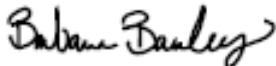
The Qualifiers in this report are defined as follows:

- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Barbara Bailey**Date:** 26 JUL 2018**Title:** Data Validator

Sample Data Summary

Semi-Volatile
Certificate of Analysis
Sample Summary

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SDG Number: GEL453849
Lab Sample ID: 453849001

Client ID: B3JBY9RE
Batch ID: 1780068
Run Date: 07/09/2018 19:06
Prep Date: 07/09/2018 09:05
Data File: s070918.B\s4g0921.D

Date Collected: 06/29/2018 11:35
Date Received: 07/03/2018 08:50
Client: CPRC001
Method: SW846 3510C/8270D SIM
Inst: MSD4.I
Analyst: JMB3
Aliquot: 1120 mL
Column: DB-5ms

Matrix: WATER
Project: CPRC0S18006
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-55-3	Benzo(a)anthracene	UX	0.0268	ug/L	0.0268	0.0893	0.300
50-32-8	Benzo(a)pyrene	UX	0.0268	ug/L	0.0268	0.0893	0.500
205-99-2	Benzo(b)fluoranthene	UX	0.0268	ug/L	0.0268	0.0893	0.500
207-08-9	Benzo(k)fluoranthene	UX	0.0268	ug/L	0.0268	0.0893	0.500
191-24-2	Benzo(ghi)perylene	UX	0.0268	ug/L	0.0268	0.0893	1.00
53-70-3	Dibenzo(a,h)anthracene	UX	0.0268	ug/L	0.0268	0.0893	1.00
193-39-5	Indeno(1,2,3-cd)pyrene	UX	0.0268	ug/L	0.0268	0.0893	1.00
86-73-7	Fluorene	UX	0.0268	ug/L	0.0268	0.0893	3.00
218-01-9	Chrysene	UX	0.0268	ug/L	0.0268	0.0893	5.00
206-44-0	Fluoranthene	UX	0.0268	ug/L	0.0268	0.0893	5.00
120-12-7	Anthracene	UX	0.0268	ug/L	0.0268	0.0893	10.0
85-01-8	Phenanthrene	UX	0.0268	ug/L	0.0268	0.0893	10.0
83-32-9	Acenaphthene	UX	0.0268	ug/L	0.0268	0.0893	20.0
91-20-3	Naphthalene	UX	0.0268	ug/L	0.0268	0.0893	20.0
129-00-0	Pyrene	UX	0.0268	ug/L	0.0268	0.0893	20.0
208-96-8	Acenaphthylene	UX	0.0268	ug/L	0.0268	0.0893	25.0

Semi-Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL453849
Lab Sample ID: 453849001

Client ID: B3JBY9
Batch ID: 1779394
Run Date: 07/06/2018 00:41
Prep Date: 07/05/2018 09:06
Data File: s070518.B\s5g0522.D

Date Collected: 06/29/2018 11:35
Date Received: 07/03/2018 08:50
Client: CPRC001
Method: SW846 3510C/8270D SIM
Inst: MSD5.I
Analyst: AGS1
Aliquot: 1110 mL
Column: DB-5ms

Matrix: WATER
Project: CPRC0S18006
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-55-3	Benzo(a)anthracene	U	0.027	ug/L	0.027	0.0901	0.300
50-32-8	Benzo(a)pyrene	U	0.027	ug/L	0.027	0.0901	0.500
205-99-2	Benzo(b)fluoranthene	U	0.027	ug/L	0.027	0.0901	0.500
207-08-9	Benzo(k)fluoranthene	U	0.027	ug/L	0.027	0.0901	0.500
191-24-2	Benzo(ghi)perylene	U	0.027	ug/L	0.027	0.0901	1.00
53-70-3	Dibenzo(a,h)anthracene	U	0.027	ug/L	0.027	0.0901	1.00
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.027	ug/L	0.027	0.0901	1.00
86-73-7	Fluorene	TU	0.027	ug/L	0.027	0.0901	3.00
218-01-9	Chrysene	U	0.027	ug/L	0.027	0.0901	5.00
206-44-0	Fluoranthene	U	0.027	ug/L	0.027	0.0901	5.00
120-12-7	Anthracene	U	0.027	ug/L	0.027	0.0901	10.0
85-01-8	Phenanthrene	U	0.027	ug/L	0.027	0.0901	10.0
83-32-9	Acenaphthene	U	0.027	ug/L	0.027	0.0901	20.0
91-20-3	Naphthalene	U	0.027	ug/L	0.027	0.0901	20.0
129-00-0	Pyrene	U	0.027	ug/L	0.027	0.0901	20.0
208-96-8	Acenaphthylene	TU	0.027	ug/L	0.027	0.0901	25.0

Quality Control Summary

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QC Summary**Report Date: July 10, 2018****Page 1 of 10****CH2M Hill Plateau Remediation Company****MSIN R3-50 CHPRC****PO Box 1600****Richland, Washington****Contact: Mr. Scot Fitzgerald****Workorder: 453849**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1779394										
QC1204063168	LCS										
Acenaphthene	10.0			5.65	ug/L		57 *	(70%-130%)	AGS1	07/05/18	22:03
Acenaphthylene	10.0			5.19	ug/L		52 *	(70%-130%)			
Anthracene	10.0			5.57	ug/L		56 *	(70%-130%)			
Benzo(a)anthracene	10.0			5.63	ug/L		56 *	(70%-130%)			
Benzo(a)pyrene	10.0			5.65	ug/L		57 *	(70%-130%)			
Benzo(b)fluoranthene	10.0			5.66	ug/L		57 *	(70%-130%)			
Benzo(ghi)perylene	10.0			4.98	ug/L		50 *	(70%-130%)			
Benzo(k)fluoranthene	10.0			6.05	ug/L		61 *	(70%-130%)			
Chrysene	10.0			5.67	ug/L		57 *	(70%-130%)			
Dibenzo(a,h)anthracene	10.0			4.64	ug/L		46 *	(70%-130%)			
Fluoranthene	10.0			4.81	ug/L		48 *	(70%-130%)			
Fluorene	10.0			4.89	ug/L		49 *	(70%-130%)			
Indeno(1,2,3-cd)pyrene	10.0			5.25	ug/L		53 *	(70%-130%)			

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QC Summary**Workorder: 453849****Page 2 of 10**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1779394										
Naphthalene	10.0			5.53	ug/L		55 *	(70%-130%)	AGS1	07/05/18	22:03
Phenanthrene	10.0			5.38	ug/L		54 *	(70%-130%)			
Pyrene	10.0			4.73	ug/L		47 *	(70%-130%)			
**5- α -Androstane	5.00			3.31	ug/L		66 *	(70%-130%)			
QC1204063167	MB										
Acenaphthene			U	0.030	ug/L					07/05/18	21:31
Acenaphthylene			U	0.030	ug/L						
Anthracene			U	0.030	ug/L						
Benzo(a)anthracene			U	0.030	ug/L						
Benzo(a)pyrene			U	0.030	ug/L						
Benzo(b)fluoranthene			U	0.030	ug/L						
Benzo(ghi)perylene			U	0.030	ug/L						
Benzo(k)fluoranthene			U	0.030	ug/L						
Chrysene			U	0.030	ug/L						
Dibenzo(a,h)anthracene			U	0.030	ug/L						
Fluoranthene			U	0.030	ug/L						

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QC Summary**Workorder: 453849****Page 3 of 10**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1779394										
Fluorene			U	0.030	ug/L				AGS1	07/05/18	21:31
Indeno(1,2,3-cd)pyrene			U	0.030	ug/L						
Naphthalene			U	0.030	ug/L						
Phenanthrene			U	0.030	ug/L						
Pyrene			U	0.030	ug/L						
**5- α -Androstane	5.00			2.83	ug/L		57 *	(70%-130%)			
QC1204063169 453849001 MS											
Acenaphthene	20.0	U	0.027	J	10.4	ug/L	52	(50%-96%)		07/06/18	01:13
Acenaphthylene	20.0	TU	0.027	JT	9.54	ug/L	48 *	(53%-99%)			
Anthracene	20.0	U	0.027		10.5	ug/L	52	(48%-117%)			
Benzo(a)anthracene	20.0	U	0.027		10.6	ug/L	53	(53%-103%)			
Benzo(a)pyrene	20.0	U	0.027		10.5	ug/L	53	(29%-118%)			
Benzo(b)fluoranthene	20.0	U	0.027		10.2	ug/L	51	(29%-117%)			
Benzo(ghi)perylene	20.0	U	0.027		10.6	ug/L	53	(39%-124%)			
Benzo(k)fluoranthene	20.0	U	0.027		10.9	ug/L	55	(24%-119%)			
Chrysene	20.0	U	0.027		11.0	ug/L	55	(51%-100%)			

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QC Summary

Workorder: 453849

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1779394										
Dibenzo(a,h)anthracene	20.0	U	0.027		9.96	ug/L	50	(16%-147%)	AGS1	07/06/18	01:13
Fluoranthene	20.0	U	0.027		9.12	ug/L	46	(41%-130%)			
Fluorene	20.0	TU	0.027	T	9.18	ug/L	46 *	(50%-116%)			
Indeno(1,2,3-cd)pyrene	20.0	U	0.027		11.4	ug/L	57	(39%-128%)			
Naphthalene	20.0	U	0.027	J	10.5	ug/L	53	(47%-96%)			
Phenanthrene	20.0	U	0.027		10.3	ug/L	52	(33%-121%)			
Pyrene	20.0	U	0.027	J	8.90	ug/L	45	(38%-122%)			
**5-alpha-Androstane	10.0		2.16		5.52	ug/L	55 *	(70%-130%)			
QC1204063170 453849001 MSD											
Acenaphthene	20.0	U	0.027	J	11.4	ug/L	9	57	(0%-20%)	07/06/18	01:45
Acenaphthylene	20.0	TU	0.027	JT	10.4	ug/L	8	52 *	(0%-20%)		
Anthracene	20.0	U	0.027		10.8	ug/L	3	54	(0%-20%)		
Benzo(a)anthracene	20.0	U	0.027		10.6	ug/L	1	53	(0%-20%)		
Benzo(a)pyrene	20.0	U	0.027		10.9	ug/L	3	54	(0%-20%)		
Benzo(b)fluoranthene	20.0	U	0.027		10.1	ug/L	1	51	(0%-20%)		
Benzo(ghi)perylene	20.0	U	0.027		12.5	ug/L	16	62	(0%-20%)		

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QC Summary**Workorder: 453849****Page 5 of 10**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1779394										
Benzo(k)fluoranthene	20.0	U	0.027		10.9	ug/L	0	55	(0%-20%)	AGS1	07/06/18 01:45
Chrysene	20.0	U	0.027		11.1	ug/L	1	56	(0%-20%)		
Dibenzo(a,h)anthracene	20.0	U	0.027	E	11.6	ug/L	15	58	(0%-20%)		
Fluoranthene	20.0	U	0.027		9.26	ug/L	2	46	(0%-20%)		
Fluorene	20.0	TU	0.027		9.94	ug/L	8	50	(0%-20%)		
Indeno(1,2,3-cd)pyrene	20.0	U	0.027		13.2	ug/L	15	66	(0%-20%)		
Naphthalene	20.0	U	0.027	J	13.3	ug/L	23*	66	(0%-20%)		
Phenanthrene	20.0	U	0.027		10.6	ug/L	3	53	(0%-20%)		
Pyrene	20.0	U	0.027	J	8.80	ug/L	1	44	(0%-20%)		
**5-alpha-Androstane	10.0		2.16		5.82	ug/L		58*	(70%-130%)		
Batch	1780068										
QC1204064612	LCS										
Acenaphthene	10.0				6.72	ug/L		67*	(70%-130%)	JMB3	07/09/18 16:42
Acenaphthylene	10.0				7.96	ug/L		80	(70%-130%)		
Anthracene	10.0				8.75	ug/L		88	(70%-130%)		
Benzo(a)anthracene	10.0				9.64	ug/L		96	(70%-130%)		
Benzo(a)pyrene	10.0				9.34	ug/L		93	(70%-130%)		

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QC Summary**Workorder: 453849****Page 6 of 10**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1780068										
Benzo(b)fluoranthene	10.0			9.03	ug/L		90	(70%-130%)	JMB3	07/09/18	16:42
Benzo(ghi)perylene	10.0			6.31	ug/L		63 *	(70%-130%)			
Benzo(k)fluoranthene	10.0			9.20	ug/L		92	(70%-130%)			
Chrysene	10.0			8.31	ug/L		83	(70%-130%)			
Dibenzo(a,h)anthracene	10.0			8.41	ug/L		84	(70%-130%)			
Fluoranthene	10.0			7.72	ug/L		77	(70%-130%)			
Fluorene	10.0			7.66	ug/L		77	(70%-130%)			
Indeno(1,2,3-cd)pyrene	10.0			8.35	ug/L		84	(70%-130%)			
Naphthalene	10.0			6.49	ug/L		65 *	(70%-130%)			
Phenanthrene	10.0			7.14	ug/L		71	(70%-130%)			
Pyrene	10.0			8.07	ug/L		81	(70%-130%)			
**5-alpha-Androstane	5.00			2.88	ug/L		58 *	(70%-130%)			
QC1204064611	MB										
Acenaphthene			U	0.030	ug/L					07/09/18	16:13
Acenaphthylene			U	0.030	ug/L						
Anthracene			U	0.030	ug/L						

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QC Summary**Workorder: 453849****Page 7 of 10**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1780068										
Benzo(a)anthracene			U	0.030	ug/L				JMB3	07/09/18	16:13
Benzo(a)pyrene			U	0.030	ug/L						
Benzo(b)fluoranthene			U	0.030	ug/L						
Benzo(ghi)perylene			U	0.030	ug/L						
Benzo(k)fluoranthene			U	0.030	ug/L						
Chrysene			U	0.030	ug/L						
Dibenzo(a,h)anthracene			U	0.030	ug/L						
Fluoranthene			U	0.030	ug/L						
Fluorene			U	0.030	ug/L						
Indeno(1,2,3-cd)pyrene			U	0.030	ug/L						
Naphthalene			U	0.030	ug/L						
Phenanthrene			U	0.030	ug/L						
Pyrene			U	0.030	ug/L						
**5- α -Androstane	5.00			2.97	ug/L		59 *	(70%-130%)			
QC1204064613 453849001 MS											
Acenaphthene	20.0	UX	0.0268	JX	14.3	ug/L	72	(50%-96%)		07/09/18	19:35

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QC Summary**Workorder: 453849****Page 8 of 10**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS												
Batch	1780068											
Acenaphthylene	20.0	UX	0.0268	JX	17.1	ug/L		86	(53%-99%)	JMB3	07/09/18	19:35
Anthracene	20.0	UX	0.0268	X	16.7	ug/L		83	(48%-117%)			
Benzo(a)anthracene	20.0	UX	0.0268	X	18.3	ug/L		92	(53%-103%)			
Benzo(a)pyrene	20.0	UX	0.0268	X	17.6	ug/L		88	(29%-118%)			
Benzo(b)fluoranthene	20.0	UX	0.0268	X	16.9	ug/L		85	(29%-117%)			
Benzo(ghi)perylene	20.0	UX	0.0268	X	11.8	ug/L		59	(39%-124%)			
Benzo(k)fluoranthene	20.0	UX	0.0268	X	17.4	ug/L		87	(24%-119%)			
Chrysene	20.0	UX	0.0268	X	15.7	ug/L		78	(51%-100%)			
Dibenzo(a,h)anthracene	20.0	UX	0.0268	X	15.4	ug/L		77	(16%-147%)			
Fluoranthene	20.0	UX	0.0268	X	14.9	ug/L		74	(41%-130%)			
Fluorene	20.0	UX	0.0268	X	16.2	ug/L		81	(50%-116%)			
Indeno(1,2,3-cd)pyrene	20.0	UX	0.0268	X	15.5	ug/L		77	(39%-128%)			
Naphthalene	20.0	UX	0.0268	JX	13.1	ug/L		65	(47%-96%)			
Phenanthrene	20.0	UX	0.0268	X	14.2	ug/L		71	(33%-121%)			
Pyrene	20.0	UX	0.0268	JX	14.0	ug/L		70	(38%-122%)			

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QC Summary**Workorder: 453849****Page 9 of 10**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1780068										
**5-alpha-Androstane	10.0	2.38		5.58	ug/L		56*	(70%-130%)	JMB3	07/09/18	19:35
QC1204064614 453849001 MSD											
Acenaphthene	20.0	UX	0.0268	JX	15.4	ug/L	8	77	(0%-20%)		07/09/18 20:04
Acenaphthylene	20.0	UX	0.0268	JX	18.5	ug/L	7	92	(0%-20%)		
Anthracene	20.0	UX	0.0268	X	17.5	ug/L	5	87	(0%-20%)		
Benzo(a)anthracene	20.0	UX	0.0268	X	19.3	ug/L	5	96	(0%-20%)		
Benzo(a)pyrene	20.0	UX	0.0268	X	18.9	ug/L	7	94	(0%-20%)		
Benzo(b)fluoranthene	20.0	UX	0.0268	X	17.7	ug/L	5	89	(0%-20%)		
Benzo(ghi)perylene	20.0	UX	0.0268	X	13.8	ug/L	15	69	(0%-20%)		
Benzo(k)fluoranthene	20.0	UX	0.0268	X	17.8	ug/L	2	89	(0%-20%)		
Chrysene	20.0	UX	0.0268	X	16.6	ug/L	6	83	(0%-20%)		
Dibenzo(a,h)anthracene	20.0	UX	0.0268	X	18.0	ug/L	15	90	(0%-20%)		
Fluoranthene	20.0	UX	0.0268	X	16.4	ug/L	9	82	(0%-20%)		
Fluorene	20.0	UX	0.0268	X	17.1	ug/L	6	86	(0%-20%)		
Indeno(1,2,3-cd)pyrene	20.0	UX	0.0268	X	17.8	ug/L	14	89	(0%-20%)		
Naphthalene	20.0	UX	0.0268	JX	14.7	ug/L	12	73	(0%-20%)		

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QC Summary

Workorder: 453849

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1780068										
Phenanthrene	20.0	UX	0.0268	X	14.9	ug/L	4	74	(0%-20%)	JMB3	07/09/18 20:04
Pyrene	20.0	UX	0.0268	JX	13.6	ug/L	3	68	(0%-20%)		
**5- α -Androstane	10.0		2.38		6.34	ug/L		63 *	(70%-130%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Surrogate Recovery Report

SDG Number: GEL453849

Matrix Type: LIQUID

Sample ID	Client ID	5-alpha %REC
1204063167	MB for batch 1779393	57 *
1204063168	LCS for batch 1779393	66 *
453849001	B3JBY9	48 *
1204063169	B3JBY9MS	55 *
1204063170	B3JBY9MSD	58 *
1204064611	MB for batch 1780067	59 *
1204064612	LCS for batch 1780067	58 *
453849001	B3JBY9RE	53 *
1204064613	B3JBY9REMS	56 *
1204064614	B3JBY9REMSD	63 *

Surrogate

Acceptance Limits

5-alpha- = 5-alpha-Androstane

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL453849
Work Order #: 453849**

Product: n-Hexane Extractable Material
Analytical Method: EPA 1664A/1664B
Analytical Procedure: GL-GC-E-094 REV# 16
Analytical Batch: 1779339

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
453849001	B3JBY9
1204063102	Method Blank (MB)
1204063103	Laboratory Control Sample (LCS)
1204063104	453729002(B3JBY3) Matrix Spike (MS)
1204063105	Laboratory Control Sample Duplicate (LCSD)
1204063106	453729002(B3JBY3) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Alkalinity

Analytical Method: 2320_ALKALINITY

Analytical Procedure: GL-GC-E-033 REV# 13

Analytical Batch: 1779460

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
453849001	B3JBY9
1204063332	Laboratory Control Sample (LCS)
1204063333	453485003(B3J9H4) Sample Duplicate (DUP)
1204063334	453485001(B3J9H3) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL453849 GEL Work Order: 453849

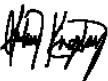
The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: **Name:** Aubrey Kingsbury**Date:** 12 JUL 2018**Title:** Data Validator

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 12, 2018

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHCPRC SAF S18-006

Client Sample ID: B3JBY9 Project: CPRC0S18006
 Sample ID: 453849001 Client ID: CPRC001
 Matrix: WATER
 Collect Date: 29-JUN-18 11:35
 Receive Date: 03-JUL-18
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Oil & Grease Analysis												
1664A_OILGREASE: COMMON "As Received"												
Oil and Grease	U	1.33	1.33	4.76	mg/L			DXB7	07/04/18	0424	1779339	1
Titration and Ion Analysis												
2320_ALKALINITY: COMMON "As Received"												
Alkalinity, Total as CaCO ₃		209000	1450	4000	ug/L			RXB5	07/10/18	1706	1779460	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 1664A/1664B	
2	2320_ALKALINITY	

Notes:Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 12, 2018

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 453849

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Oil & Grease Analysis											
Batch	1779339										
QC1204063106	453729002	DUP									
Oil and Grease		U	1.32	U	1.32	mg/L	N/A		DXB7	07/04/18	04:24
QC1204063103	LCS										
Oil and Grease	40.0				38.2	mg/L		95.5	(80%-120%)	07/04/18	04:24
QC1204063105	LCSD										
Oil and Grease	40.0				38.5	mg/L	0.782	96.3	(0%-20%)	07/04/18	04:24
QC1204063102	MB										
Oil and Grease			U	1.40	mg/L					07/04/18	04:24
QC1204063104	453729002	MS									
Oil and Grease	38.1	U	1.32		37.1	mg/L		95.5	(75%-125%)	07/04/18	04:24

Titration and Ion Analysis

Batch	1779460										
QC1204063333	453485003	DUP									
Alkalinity, Total as CaCO3			103000		102000	ug/L	0.78		(0%-20%)	RXB5	07/10/18 16:37
QC1204063334	453485001	DUP									
Alkalinity, Total as CaCO3		U	1450	U	1450	ug/L	N/A			07/10/18	16:33
QC1204063332	LCS										
Alkalinity, Total as CaCO3	100000				112000	ug/L		112	(80%-120%)	07/10/18	16:26

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range

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QC Summary

Workorder: 453849

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).										
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.										
D	Results are reported from a diluted aliquot of sample.										
N	Spike Sample recovery is outside control limits.										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of \pm the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.